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(54) Terminal contact

(57) A terminal contact (1) made from a metal sheet of even thickness has a slot (2) for receiving an insulated electrical connection wire (8, 10) and for cutting through the insulation (10) as a result of pushing of the wire into the slot. The slot is, at least along an

inner part, provided with bevelled sides (7). The bevelled sides (7) of the slot are smooth and bright and are produced by inserting a wedge shaped portion of an anvil through a slot in a metal sheet and stamping two elongate grooves (4) in the sheet to cause the metal to be pressed against the wedge shaped portion.

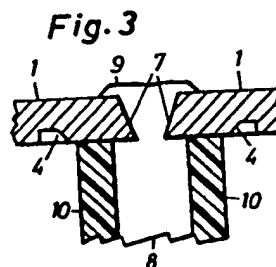
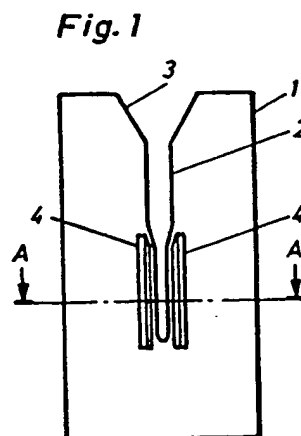
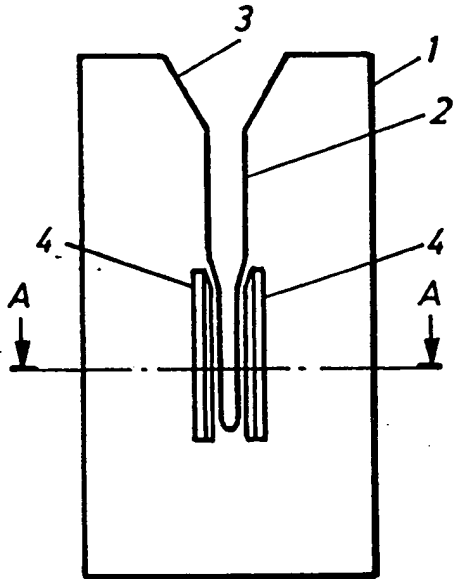
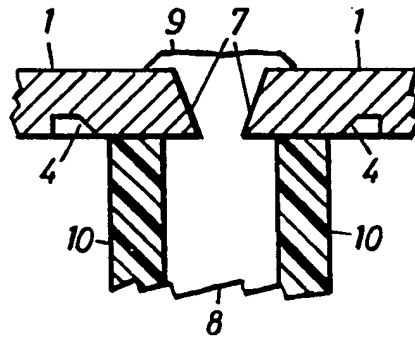
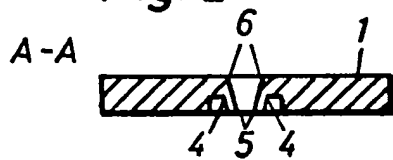
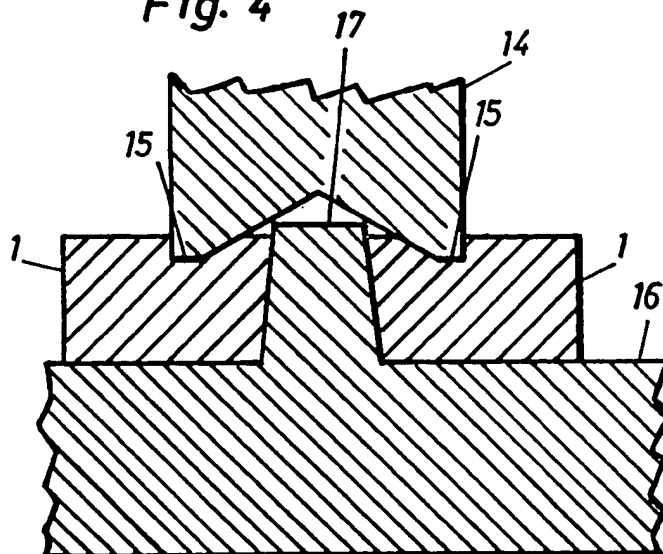


Fig. 1**Fig. 3****Fig. 2****Fig. 4**

SPECIFICATION

A terminal contact

The present invention relates to a terminal contact.

5 Terminal contacts having slots for receiving insulated electrical connection wires, the insulation of which does not need to be removed in advance, are described in Swedish Patent Specification No. 365,657. In this there is also
10 shown a tool for pushing down an electrical connection wire into the slot of a terminal contact and for cutting the wire after the pushing down. There is, however, a risk that the cut wire works loose from the slot if it is exposed to pulling.

15 -According to one aspect of the present invention there is provided a terminal contact made from a planar metal sheet of even thickness having a slot for receiving an insulated electrical connection wire and for cutting through the
20 insulation of the connection wire as a result of pushing the wire into the slot, in which contact at least along an inner part of the slot, the edges of the slot on one of the sides of the metal sheet are closer to each other than the edges on the other
25 side of the metal sheet.

Such a terminal contact could also be made according to the teachings of our British Patent Specification No. 1,519,383, by having a toothed aperture for the slot. For example, it could be in
30 the form of a U-shaped bent metal sheet as described in that specification, at least along an inner part of one of the slots the edges of the slot on one of the sides of the sheet being closer to each other than the edges on the other side of the
35 metal sheet.

Several terminal contacts according to the present invention can, in a manner known per se, be brought together in a connection terminal board.

40 Preferably, the opposite sides of the slot along the said inner part are smooth and bright.

According to another aspect of the present invention there is provided a punching tool for manufacturing a terminal contact made of a planar
45 metal sheet of even thickness having a slot for receiving an insulated electrical connection wire and for cutting through the insulation of the connection wire as a result of pushing the wire into the slot, the tool comprising a punch with two
50 elongate, narrow and parallel pressing surfaces with a gap between them, and an anvil providing a support bed for the terminal contact, on which anvil an elongate and narrow, wedge-shaped holder protrudes towards the gap between the
55 pressing surfaces of the punch.

According to yet another aspect of the present invention there is provided a method of manufacturing a terminal contact from a planar metal sheet of even thickness having a slot for
60 receiving an insulated electrical connection wire and for cutting through the insulation of the connection wire as a result of pushing the wire into the slot, the method comprising the steps of:—

65 a) punching a slot in a planar metal sheet of even thickness;

b) placing the metal sheet on an anvil of a punching tool with at least an inner part of the slot receiving a wedge-shaped holder protruding from
70 the anvil; and

c) stamping two shallow, elongate and narrow grooves in the metal sheet, one on each side of the said part of the slot, parallel with it and close to it with such a depth of penetration that the
75 material of the metal sheet is pressed against the wedge-shaped holder.

A tool for pressing down an electrical connection wire into the slot of a terminal contact according to the present invention could be as
80 shown in the above-mentioned Swedish patent specification, the tool being modified according to the actual design of the terminal contact and according to any connection terminal board in which the terminal contact is to be placed.

85 The invention will now be described by way of example with reference to the accompanying drawing, in which:—

Figure 1 is a plan view of a terminal contact,

90 Figure 2 is a section through the terminal contact along the line A—A in Figure 1,

Figure 3 is a section through the terminal contact with a connection wire inserted in a slot of the contact, and

Figure 4 shows part of a punching tool.

95 A terminal contact 1 shown in Figure 1 is made from a planar rectangular metal sheet of even thickness, in one of the short sides of which a slot 2 has been cut along the major part of the length of the terminal contact. The slot 2 widens into a V-shaped aperture 3.
100

Along a part of the slot 2 (approximately the inner half of the slot measured along its length), the edges 5 of the slot on one side of the metal sheet are closer to each other than its edges 6 on the other side of the metal sheet (see Figure 2). The difference in distance between the edges has been attained by punching two shallow grooves 4 on the said one side of the metal sheet, parallel with the slot and at a distance from it approximately the same as the original width of the slot. The grooves 4 extend somewhat beyond the innermost end of the slot.
105

In the above-mentioned part of the slot 2 (where the sides 7 of the slot form an angle to each other, see Figure 3) the sides 7 of the slot are smooth and bright.
110

Referring to Figure 3, by using a tool (not shown) a connection wire having a metallic core 8 and insulation 10 can be pushed into the above-mentioned part of the slot 2 and then cut that side of the terminal contact 1 where this part of the slot is wider. The metallic core 8 of the connection wire will then be pressed into by the sides 7 of the slot, and if the tool cuts the wire at a slight distance from the side of the terminal contact, a small projection 9, which can be compared with a rivet head, will be formed by the core of the connection wire. Both the sides 7, pressing in in a wedging manner, and the small projection 9 co-
120
125

operate to give the connection a resistance against pulling in the direction of the wire.

As the sides 7 of the slot, which are intended to press into the metallic core 8 of the connection wire, are smooth and bright, the surfaces of these sides and the core where they meet press so close to each other that the connection is substantially gas-tight, thus preventing air or corrosive gases from influencing by corrosion the junction resistance between the terminal contact and the connection wire.

The insulation 10 of the connection wire only remains on the side opposite to that side of the terminal contact where the connection wire was cut.

The inclination of the sides 7 of the slot and the smooth and bright surfaces of these sides are achieved by means of a punching tool, shown in section in Figure 4. A movable punch 14 is designed with two elongate, narrow and parallel pressing surfaces 15, the longitudinal direction of which runs perpendicularly to the plane of the figure. Between the pressing surfaces there is a gap. An anvil 16 provides a bed for the terminal contact 1 when it is to be worked by the punching tool. An elongate and narrow wedge-shaped holder 17 is arranged to protrude from the anvil 16 towards the gap between the two pressing surfaces 15 of the punch 14. The two bevelled side surfaces of the wedge-shaped holder 17 are smooth and bright.

The method for achieving the inclination of the sides 7 of the slot are as follows:—

The slot 2 is punched in a metal sheet which provides the material for the terminal contact 1.

The metal sheet is placed on the anvil 16 of the punching tool, the innermost part of the slot being placed on the wedge-shaped holder on 17 of the anvil.

Two shallow, elongate and narrow grooves 4 are stamped in the metal sheet one on each side of the slot 2 and parallel with and close to this, with such a depth of penetration that the material of the metal sheet is pressed against the wedge-shaped holder 17.

By the stamping with the two pressing surfaces 15 of the punch 14, the metal in the sheet will be permanently moved towards the middle of the slot so that the sides of the slot will differ in direction away from that side where the stampings are made. As the sides of the wedge-shaped holder 17 are smooth and bright, the pressing of the metal against its sides leads to the inner sides 7 of the slot also being smooth and bright.

The dimensions of the innermost part of the slot 2 are determined with great exactitude by the dimensions of the wedge-shaped holder 17 and by providing different dimensions for the latter, desired dimensions of the slot can be obtained.

In the described example, the thickness of the terminal contact is 0.4 mm. The slot 2 is punched to a width of 0.43 mm. Within that part of the slot where its sides are inclined to one another, the width is 0.43 mm where it is greatest and 0.3 mm where it is least. Connection wires where the metallic core has a diameter within the range from 0.4—0.7 mm can be connected to this terminal contact. Terminal contacts having other dimensions for the slot can accommodate connection wires of other dimensions.

CLAIMS

1. A terminal contact made from a planar metal sheet of even thickness having a slot for receiving an insulated electrical connection wire and for cutting through the insulation of the connection wire as a result of pushing the wire into the slot, in which contact at least along an inner part of the slot, the edges of the slot on one of the sides of the metal sheet are closer to each other than the edges on the other side of the metal sheet.

2. A terminal contact according to claim 1, wherein the opposite sides of the slot along the said inner part are smooth and bright.

3. A terminal contact, substantially as herein described with reference to Figure 1 and 2 of the accompanying drawing.

4. A punching tool for manufacturing a terminal contact made of a planar metal sheet of even thickness having a slot for receiving an insulated electrical connection wire and for cutting through the insulation of the connection wire as a result of pushing the wire into the slot, the method a punch with two elongate, narrow and parallel pressing surfaces with a gap between them, and an anvil providing a support bed for the terminal contact, on which anvil an elongate and narrow, wedge-shaped holder protrudes towards the gap between the pressing surfaces of the punch.

5. A pressing tool, substantially as herein described with reference to Figure 4 of the accompanying drawing.

6. A method of manufacturing a terminal contact from a planar metal sheet of even thickness having a slot for receiving an insulated electrical connection wire and for cutting through the insulation of the connection wire as a result of pushing the wire into the slot, the method comprising the steps of:—

a) punching a slot in a planar metal sheet of even thickness;

b) placing the metal sheet on an anvil of a punching tool with at least an inner part of the slot receiving a wedge-shaped holder protruding from the anvil; and

c) stamping two shallow, elongate and narrow grooves in the metal sheet, one on each side of

the said part of the slot, parallel with it and close to it with such a depth of penetration that the material of the metal sheet is pressed against the wedge-shaped holder.

7. A method of manufacturing a terminal contact, substantially as herein described with reference to Figure 4 of the accompanying drawing.

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